A TREATISE

UPON THE

EXTRACTION of the Cryſtalline Lens.

BY

GEORGE BORTHWICK,

SURGEON of the Fourteenth Regiment of Dragoons.

"QUI DAT VIDERE, DAT VIVERE." OVID.

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TO

MR. ROBERT DODS,

SURGEON OF HIS MAJESTY'S ROYAL

HOSPITAL AT HASLAR,

THE

FOLLOWING PAGES

ARE HUMBLY INSCRIBED BY

HIS OBEDIENT SERVANT

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PREFACE.

NO part of ſurgery ſeems to be ſo much overlooked by chirurgical writers, as that which conſtitutes the ſubject of the following pages; and I believe that this obſervation is ſtill more applicable to the modern operators. The extraction of the opaque cryſtalline lens ſeems, in general, to have been looked upon as the province of quacks and boaſting pretenders: and when we reflect but for a moment, we need not wonder that this is the caſe, ſince the credulity of mankind conſtantly keeps pace with the groſſneſs of the impoſture; from which circumſtance thoſe ſet of men have had many opportunities of operating, where the regular ſurgeon, leſs laviſh of promiſes, has been conſidered as an ignorant man. I am, however, extremely ſorry to obſerve, that many ſurgeons, otherwiſe eminent in their profeſſion, are upon this ſubject very unſkilful; which I take

to

to be owing to a lazineſs that prevents them from taking ſufficient pains to acquire a true anatomical knowledge of the eye, and of not being properly verſant with the uſe of the knife upon the eyes of dead ſubjects, without which it is almoſt impoſſible that a ſurgeon ſhall ever be ſucceſsful in operating upon the living body; whereas, were we to confine our blunders to the firſt times of operating upon dead ſubjects, we ſhould, by more practice in this way, attain ſuch a dexterity, as would give us reaſonable aſſurance of ſucceſs in practiſing upon the living ſubject. To induce ſurgeons to take this manner of acquiring knowledge, to be able to cure a diſeaſe ſo diſtreſſing to the unhappy patient, is the chief motive of the following pages. But I ſhould not have ventured to give my opinion upon a ſubject of ſo much importance, had not the doctrine that I have advanced been ſo fortunate as to meet with the approbation of a very reſpectable ſociety of gentlemen, before whom it was read two ſucceſſive ſeaſons. This being the caſe,

caſe, I can no longer doubt of the opinion of the public agreeing with theirs; and if what is here advanced can ever prove of any ſervice to mankind, I ſhall conſider myſelf more than amply rewarded for my trouble. If the learned are not diſobliged, I ſhall be extremely happy; if the ignorant are inſtructed, I ſhall be much more ſo. Although it is impoſſible to underſtand rightly the nature of the diſeaſe of which I am about to treat, or to have a clear idea of the ſteps of the operation, without keeping the anatomical ſtructure of the parts concerned conſtantly in view; yet I imagine it will be unneceſſary to trouble the reader with a deſcription of all the different coats and humours of the eye, ſince this may be obtained pretty accurately from ſeveral books of anatomy, and particularly from the works of the accurate *Zin.* Such a deſcription is likewiſe now rendered leſs neceſſary, as, by a very little trouble, the reader may have an accurate account of all the different parts of the eye, by looking back to the chapter upon that ſubject

ſubject in the TREATISE alongſt with which this is printed *. With this view, I ſhall only conſider ſome particulars in the anatomy that more eſpecially concern ſeveral phænomena ſometimes attending the diſeaſe in queſtion.

* The author here alludes to an Anatomical Work that will ſoon make its appearance, alongſt with which this was at firſt intended to have been printed.

A

TREATISE

UPON THE

EXTRACTION of the Cryſtalline Lens.

ANATOMICAL REMARKS.

THAT I may be able to explain with more perſpicuity the diſeaſe of the cryſtalline lens termed *cataract*, and the manner in which it is to be removed by the operation, I find myſelf under the neceſſity of making a few remarks concerning the ſtructure of that body, and the capſule in which it is included. And, firſt, we may obſerve, that the lens is made up of two elliptical convex portions or ſides; the anterior of which is flatter, and the poſterior more convex. Its ſtructure is that of concentric plates or ſcales ſucceeding each other, and compoſed by the fibres themſelves, regularly figured and contorted. Betwixt the cryſ-

talline leaves is alſo contained a pellucid liquor, which in old age acquires a yellow colour. From this circumſtance we may learn one cauſe of dimneſs of ſight that elderly people generally have, which is very different from that degree of blindneſs which is owing to a diminution of the aqueous humour. Hence, likewiſe, we may learn, why old people do not receive all the advantage they would wiſh from the uſe of the convex glaſs; which they would more readily do, if the want of ſight depended only on a leſs convexity of the cornea from a diminution of the aqueous humour, though the diminution of this fluid has no doubt a conſiderable effect. The innermoſt ſcales of the lens lie cloſer together, and form at laſt a ſort of continued nucleus harder than any other part of the lens. The cryſtalline lens is incloſed in an interſtice of the capſule that covers the vitreous maſs. This tunicle, at the edge of the cryſtalline lens, is divided into two layers: The external of which is continued over the lens; the internal deſcends behind the lens; and while it covers the foſſa of the vitreous humour in which the poſterior

rior ſurface of the lens is lodged, it likewiſe affords a covering to that portion of the lens itſelf. I ſhall ſay nothing concerning the vitreous humour; but only obſerve, that it has a ſaline taſte; and, when expoſed to a gentle heat, gradually runs into a fluid ſtate. If the heat is continued, it evaporates without leaving any reſiduum; and, in all theſe qualities, it exactly agrees with the aqueous humour.

Since we ſee the vitreous and aqueous humours poſſeſs the ſame ſenſible qualities, may we not ſuppoſe that they are of a ſimilar nature?

May we not be confirmed in this opinion by obſerving, that the vitreous humour can be in part regenerated as well as the aqueous, when a ſmall quantity of it happens to eſcape from the eye?

And does not the gelatinous appearance of the vitreous humour taken from a recent eye depend ſolely on this watery fluid being contained in a number of ſacculi, from which, when broke by the hand, or expoſed to heat, it immediately iſſues?

CATARACT.

BEFORE I enter upon the nature of the diſeaſe in queſtion, it may perhaps not be improper to give ſuch a definition of it as may ſerve to diſtinguiſh it from any other affection of the eye: And for this purpoſe I think the definition of *Vogel* is ſufficiently characteriſtic, viz. "*Cæcitas cum obſcurata lente retro pupillam conſpicua.*" From this definition, it will be very eaſy to diſtinguiſh the cataract from an *amauroſis*, or *gutta ſerena*, which the ancients erroneouſly termed the *black cataract*. It is extremely difficult to give a hiſtory of this diſeaſe that will apply to patients in general, ſince in one patient the progreſs of the opacity is often much quicker than in another. All that we can ſay with any certainty, is, that the patient's ſight gradually becomes dim, till at length he is only able to diſtinguiſh darkneſs from light; and very often the eye is even totally inſenſible to the rays of the ſun. Sometimes the diſeaſe is attended with pains in the forehead: but we may conclude in general, that a cure may with more probability

bility be expected in proportion to the abſence of pain; but, at the ſame time, we are not to be alarmed although the patient may have felt ſome little pain during the progreſs of the diſeaſe.

It is needleſs to take notice of the different ſpecies of cataracts which ſome ſurgeons have mentioned; as I ſhall attempt, in the ſequel, to ſhow, that the exiſtence of ſuch a variety of ſpecies as are met with in the books of ſurgery is altogether improbable.

In deſcribing the nature of a cataract, it is a maxim laid down by almoſt all ſurgeons, that there is one ſtage of the diſeaſe in which only the operation is proper; and this ſtage is ſaid to be the maturity of the cataract. They have compared it to the ripening of fruit, and have ſuppoſed a regular change in the conſiſtence of the cryſtalline humour from the moment it is affected. But I imagine that this is not true in fact, ſince cataracts are often extracted at very different ſtages, and without having the appearance of this ſuppoſed change.

There ſeems indeed ſome ground to believe, that, in proportion as the lens becomes

opaque,

opaque, it gradually acquires a conſiſtence ſomewhat firmer than what it has in the ſound ſtate; while, at the ſame time, I have extracted cataracts in which I was not able to obſerve this circumſtance.

We are as yet unable to aſſign any cauſe for this diſeaſe, in a manner at all ſatisfactory. There are, however, ſome few cauſes, that, in my opinion, may in ſome meaſure produce an opacity of this organ,

Thoſe cauſes we muſt preſume to affect principally the pellucid veſſels that convey the nutrition to the lens *. If, for example, any

* It is not at all clear from anatomy, that the cryſtalline lens is nouriſhed by a continuation of veſſels from the capſule of the lens entering its ſubſtance. Were we indeed to reaſon merely from analogy, we ſhould ſuppoſe, that a circulation of this kind takes place, when we ſee that the cartilages and cornea of the eye are ſupplied by colourleſs arteries, which terminate in colourleſs veins, and which altogether deny admiſſion to a coloured injection: Yet when we conſider ſome appearances and morbid phænomena, I am afraid that this ſort of circulation in the lens will be rendered ſomewhat doubtful.

It is true indeed, that red veſſels can be perceived in the body of the lens of a fœtus, continued from the

any degree of inflammation happens in thoſe veſſels, the pellucid branches of which are ſent to the cryſtalline capſule, theſe branches may be immoderately diſtended, (ſuppoſing only the colourleſs part of the blood to

the capſule. But even although this ſtructure takes place in the infant ſtate, we are not to ſuppoſe from thence that the ſame takes place in the adult, only with this difference, that thoſe veſſels that formerly conveyed red blood now only admit the ſero-lymphatic part to enter. We perceive many ſingularities in the fœtus, the ſmalleſt veſtiges of which are allowed not to exiſt in the adult. In the fœtus we perceive a membrana pupillaris, which ſoon entirely diſappears; why may we not ſuppoſe the ſame thing to happen with the veſſels that paſs to the lens? If we take out the vitreous humour and cryſtalline lens adhering together, from the eye of an animal, and then make a ſmall inciſion in the cryſtalline capſule, the lens immediately ruſhes out, although no preſſure is made, without ſeeming to meet with any reſiſtance from the connection of veſſels.

Upon the whole, I think it is not eaſy to prove whether the nutrition of the lens is carried on by a continuation of veſſels, or by an effuſion of fluid into the aranea, and by that means the lens leading a vegetable life. Future obſervations and inquiries may perhaps eſtabliſh one or other of thoſe opinions.

to enter them); which happening either in the capſule or the lens itſelf, may in ſuch delicate parts greatly diſturb their natural functions. Were we to ſuppoſe that the lens had in reality no connection with the capſule by means of veſſels, we might eaſily conceive, that an immoderate quantity of fluid being depoſited in the cavity of the capſule, might, by its remora, acquire ſuch qualities, as to render it unfit for ſupplying proper nouriſhment to an organ ſo delicate as the cryſtalline lens.

I ſhall not take upon me to ſay that this is always the cauſe of cataracts; but ſhall relate the following caſe, to ſhew, that this opinion is not in ſome caſes altogether improbable.

CASE I.

A WOMAN of middle age, had, about four years before I ſaw her, been affected with a gradual loſs of ſight in both eyes, which in the ſpace of a year rendered her ſo blind as that ſhe could only diſtinguiſh light from darkneſs. As ſhe was deſirous of ſubmit-

mitting to any operation that might prove ſucceſsful, I extracted the lens from her left eye, in preſence of Meſſrs. Hunter and Maclellan, both members of the phyſico-chirurgical ſociety. Having cut the cornea in the manner that ſhall be afterwards directed, I attempted to effect the exit of the lens by gentle preſſure, as not unfrequently happens: but this method not anſwering the purpoſe, I introduced the gold needle of De Winſel through the pupil; with which I ſcratched the capſule, to procure with more eaſe and ſafety the diſcharge of the lens. As ſoon as I had punctured the capſule, a milky-coloured fluid iſſued from its cavity. Upon ſeeing this, I imagined I had met with what is mentioned by authors under the name of the *milky cataract*, and which is conſidered as not admitting of cure. A few drops of this fluid having come away; by making a gentle preſſure, the lens made its appearance through the pupil, and was eaſily extracted.

I muſt now ask thoſe who are more verſant in things of this nature than myſelf, What was the cauſe of this phænomenon?

Was it owing to the fluid which is naturally ſent to the lens being poured in too great quantity into the cavity of the capſule, and by its continuance there becoming putrid?

Or did it depend upon a morbid ſtate of the veſſels of the lens that prevented the admiſſion of their natural nouriſhment?

Or is it to be explained upon the ſuppoſition that the veſſels of the capſule enter the body of the lens, and that by a rupture of ſome of thoſe veſſels this appearance is produced?

Or does this phænomenon make it probable, that the lens is nouriſhed by the abſorption of a fine fluid from the cavity of its capſule?

It may perhaps not be amiſs to inform the reader, that this appearance did not depend upon any part of the lens being diſſolved, as it was perfectly ſound in this reſpect, and of the uſual ſize; partaking, in a great degree, of that browniſh colour that cataracts generally have.

From this caſe, I ſuppoſe, we may in ſome meaſure explain, why ſurgeons have been now and then foiled in couching cataracts

racts attended with this circumſtance, and why they have been impoſed upon by the appearance of this milky fluid. When they penetrate the capſule of the lens with the couching needle, the aqueous humour, by the iſſuing of the fluid, is immediately rendered cloudy; and they, being unable from this operation to find out the true cauſe of the appearance, conclude, that the cataract is of ſuch a ſoft conſiſtence as not to admit of depreſſion.

That this has really been a miſtake of ſurgeons, appears the more probable, when we conſider, that this ſoft conſiſtence of cataracts is chiefly mentioned by thoſe ſurgeons who practiſed couching.

Having thus mentioned, with the greateſt diffidence, thoſe few circumſtances concerning the nature of the diſeaſe in queſtion, I have only to add to what I have ſaid upon this head, that the true cauſe of the cataract perhaps ſtill remains to be determined; and ſhall therefore conclude this part of the ſubject in the words of Horace,

——*Quæ*
Deſpero tractata niteſcere poſſe relinquam.

With regard to the prognoſis of this diſeaſe, ancient and modern practice teach us, that there is ſcarce any diſorder the event of which is more precarious than that of a cataract.

To ſay the truth, medicines will generally have little or no effect, when the diſorder is confirmed; unleſs we believe with Stork, that cicuta diſſolves the lens, in the ſame manner as it is ſuppoſed to diſſolve ſchirrous tumours. Yet there may be ſome caſes in which this diſeaſe may be recommended to the care of the phyſician; nor are there caſes wanting among the ancients *, of patients who by the aſſiſtance of medicines have in this diſeaſe received conſiderable relief, eſpecially when the diſorder is incipient, or not firmly rooted in the lens.

But leaving the phyſician to preſcribe a proper regimen and courſe of medicines adapted to the patient's age, habit, and other circumſtances; I ſhall proceed immediately to deſcribe the manner of curing cataracts chirurgically, by the help of the hand and convenient inſtruments.

But

* Celsus, cap. vi. lib. 6.

But before I proceed to the operation, it may not be improper to conſider in what caſes it is adviſeable.

It is a general maxim amongſt practitioners, that unleſs the iris, when the eye is expoſed ſuddenly to the light, poſſeſſes a free contraction, we are not to undertake the operation; for unleſs the iris contracts freely, they conclude, that the cataract is either complicated with a gutta ſerena, or an adheſion of the iris to the cryſtalline capſule. But that this is a miſtake will appear, when we conſider, that the lens is often ſo opaque as entirely to prevent the rays of light paſſing to the retina, and conſequently we need not expect to find any contraction of the iris. While the light was imagined to paſs between the iris and lens through ſuppoſed interſtices in the ciliary proceſſes, the notion of the iris poſſeſſing a power of contraction, even although the lens was opaque, might appear plauſible: but we now know, that the iris is not a continuation of the choroides, but a diſtinct muſcle; and that the former is collected into folds, the extremities of which are firmly attached to the

the ſides of the cryſtalline capſule. From which ſtructure, it is plain, that no rays of light can reach the retina without paſſing through the lens; and when it is become ſo opaque as totally to exclude the light, we need not reckon the ſucceſs of the operation improbable, although the iris, when the eye is expoſed even to the rays of the ſun, does not contract *.

Theſe facts being conſidered, will, I apprehend, go far to prove, that the common manner of trying the ſenſibility of the retina is in many caſes extremely fallacious.

With regard to the adheſion of the iris with the capſule of the lens, I preſume, from what is ſaid above it will appear, that although this organ has loſt all power of contraction, yet this circumſtance alone can give us no reaſon to think that any ſuch adheſion has taken place. The prognoſis, however, will be leſs favourable if the patient complains of violent pain in the head; if the pupil has the appearance of being as it were lacerated, and loſt its round figure: in

* This was the caſe with the left eye of the patient mentioned in the Medical Commentaries, Vol. II. N° 1

in ſuch caſes, ſmall pellicles ſometimes grow out from the circular fibres of the iris, towards the pupil. In ſuch circumſtances there is indeed reaſon to ſuppoſe that an adheſion of the iris with the cryſtalline capſule may take place. When pellicles of this kind appear in the pupil, and when of conſequence there is reaſon to ſuſpect an adheſion to have taken place, the operation is ſcarcely adviſeable: for, in the firſt place, this morbid appearance of the iris ſhows us, that a conſiderable degree of inflammation has already ſeized it; and we have reaſon to fear, that highly dangerous conſequences might enſue from the admiſſion of air into the cavity of the eye under ſuch circumſtances.

And ſince we daily obſerve, that the admiſſion of air into the other cavities of our body is often attended with fatal conſequences, may we not attribute the want of ſucceſs ſometimes attending the extraction of the lens, though performed in the niceſt manner and under the moſt favourable circumſtances, to the acceſs of the air? Nay, I think it is highly probable, that, from this circumſtance, we are able to explain, why

ſome

ſome patients who receive ſight from the extraction of the opaque lens, ſoon after become as blind as before the operation; viz. that, by the admiſſion of the air, the wounded capſule is affected in ſuch a manner, as to prevent its healing ſo kindly as to retain its tranſparency: and this opinion is made more probable from this circumſtance hapening oftener after extraction than couching.

But may we not ſuppoſe, that ſurgeons have often been deceived, in imagining the depreſſed cataract to riſe again, while the cauſe of the returned blindneſs depended on the capſule becoming opaque?

Although the caſe is moſt favourable where the dimneſs of ſight comes on gradually, and not attended with any pain in the head or eye; yet the following caſe will ſhow us, that we ought not always to be alarmed although the patient has inſtantly been deprived of ſeeing.

Case II.

William Taylor, aged 37, had, about fifteen years before I ſaw him, loſt the ſight of

of both eyes when he was aſleep. He enjoyed his ſight perfectly well at the time he went to bed; but was much ſurpriſed on finding, when he awaked, that he was not able to perceive light, although he ſlept in a room where the window had no ſhutters, and heard both the people without and in the houſe employed at the work that was carried on in the day-time. Upon examining the eye *, I found, that, when it was expoſed to the light, the iris contracted freely; and would therefore have doubted of his account of the caſe, had it not been confirmed by his relations. Encouraged in this caſe from the contraction of the iris, notwithſtanding his ſudden loſs of ſight, I extracted the cryſtalline lens from his left eye in preſence of a conſiderable number of gentlemen, and the man is extremely happy with the ſight he now enjoys from the operation.

The ſudden loſs of ſight was in this caſe no doubt owing to a palſy of the optic

d nerves:

* He had now only in reſerve the left eye; the right had been formerly mangled by a ſurgeon in attempting to extract the lens.

nerves: but its event proves, that this affection had in a conſiderable degree gone off; and that, if the lens had not become opaque, he would have recovered his ſight.

Could this affection of the retina in any meaſure produce an opacity of the lens?

Might the palſy of thoſe nerves render the circulation within the globe more languid?

And might not the tranſparency of the lens ſuffer by this languid circulation?

If the cornea is opaque, the operation can be of no ſervice. If there is an inflammation upon the eye, we ought not to operate until it is removed. If there is any diſeaſe about the parts concerned in the œconomy of the eye that might tend to increaſe the inflammation uſually conſequent upon this operation, the uſe of the knife is prohibited ſo long as theſe diſeaſes ſubſiſt.

Nor ſhould the operation be performed upon thoſe labouring under a cough, leſt, by the patient's being diſturbed from thoſe ſymptoms during the operation, the eye might be irrecoverably loſt. The operation

is

is not adviſeable upon young children, on account of their ſtruggling.

When the diſeaſe ſeems even deſperate, we might ſtate to the patient its precarious event, and give him by the operation what chance of cure the nature of the caſe would admit.

If one eye only is affected with cataract; and the other ſound, or in a conſiderable degree uſeful; the operation ought not to be undertaken, even ſuppoſing the diſeaſe of the moſt favourable kind: for let the ſucceſs of the operation be ever ſo happy, the eye from which the lens is taken can never, even by the uſe of glaſſes, be reſtored to a degree of perfection at all equal to that of the ſound eye.

In order to the more ſucceſsful performance of the operation, a convenient ſeaſon ought to be choſen, and the patient beforehand kept to a proper regimen.

With regard to the firſt, the air ought to be temperate as to heat and cold: For the latter, he ought, for ſome days before the operation, to be confined to a ſpare diet; and, if plethoric, ſhould be blooded.

The apartment for the operation will be the more proper as it is lighter; provided it is lighted from the north, or from the top of the room: for from a ſouth light, the ſun might ſhine upon the patient; and, unleſs the lens was very opaque, might make the pupil contract, and render extraction more difficult.

Having, then, the higheſt degree of probability that the retina is not affected, I come to conſider the proper inſtruments and operation.

The only inſtruments neceſſary, are, the *ſpeculum oculi and extracting knife of Miller,

* Some ſurgeons alledge, that an improvement might be made upon this inſtrument, by having a part of one of its ſides not complete. But certainly there is in fact no reaſon for this alteration.

If they mean, by this contrivance, to be better able to take off the preſſure than with the ſpeculum, the ſides of which are complete; it is only in other words telling us, that they are entirely ignorant of this operation. Some theoriſts in ſurgery have imagined, that by it we are able to take off the ſpeculum altogether, even before the inciſion of the cornea is completely made. To this I anſwer, that until the lens is taken from the eye, the ſpeculum ought not to be removed.

Miller, together with the gold probe of De Winſel; which are now ſo generally known, that a deſcription of them would be unneceſſary.

We ought to be provided with ſpecula of different ſizes, ſo as that this inſtrument may be adapted to the patient's eye in the moſt accurate manner, without which we ſhall be much embarraſſed in operating.

It would certainly ſave the patient a good deal of pain, and equally well ſupport the eye-lid, if the ſpeculum, inſtead of having a groove with two ridges, were made with a ridge on the fore-part, and a flat ſurface behind, upon which the eye-lid might reſt, and be ſupported before by the ridge. I imagine the inſtrument made in this manner would not occaſion ſo much inflammation as the ſpeculum commonly employed often does.

The groove in the common inſtrument is deſigned to receive the edge of the eye-lid; which if it does not do in the moſt exact manner, it cannot fail of very much irritating the adnata, a circumſtance which ought particularly to be guarded againſt in this operation.

OPERATION.

THE patient being ſeated in a low chair, with his face to the light, the ſurgeon muſt ſit exactly oppoſite to him, on a ſeat ſomewhat higher. During the operation, the ſurgeon ſhould have his hand with which he operates ſupported, by leaning his elbow on the ſide of a table, or upon his knee ſomewhat raiſed by placing his foot upon a ſtool; and the beſt rule is, to have his elbow ſo ſupported, as that he may with that hand have a full command of the patient's eye. This being done, an aſſiſtant ſtands behind the patient, who places his right hand under the patient's chin, and raiſes the head againſt his breaſt, directing his face a little upwards. The ſame aſſiſtant lifts up the ſuperior eye-lid with the fore and middle fingers of his left hand, taking care not to preſs the globe of the eye above. The operator next applies the ſpeculum, (which ought only to take in the cornea and 1-12th of an inch of the ſclerotic coat), to keep the

eye

eye ſteady; which, being applied, he ſupports with his left hand *.

The aſſiſtant has now only to keep the patient's head ſteady; and the operator having received the knife from another aſſiſtant, holds it with his thumb, fore and middle fingers, ſupporting his hand by reſting the ring and little fingers upon the patient's cheek.

He then introduces the point of the knife at the middle of that part of the cornea moſt diſtant from the noſe, nearly, but not exactly, at its joining with the ſclerotic coat. As ſoon as the point of the knife is introduced into the cornea, we ought to be particularly careful in uſing no more preſſure with the ſpeculum than is abſolutely neceſſary to keep the eye ſteady; otherwiſe we run the greateſt danger of bringing the humours of the eye nearer to its anterior part than uſual, and by that means oppoſe the iris to the point of the knife †. The point of the knife being

* The reader will obſerve, that this deſcription is meant to apply to the operation when performed upon the left eye.

† It has been alledged, that the eye remains fixed and

being introduced, and the preſſure of the ſpeculum being in ſome meaſure taken off, we continue the inciſion, by paſſing the point of the knife through the anterior aqueous chamber, and bringing it out at the ſide of the cornea next the noſe. Then, by moving the knife gently downwards, we finiſh the inciſion of the under part of the cornea. There ſeems to be little neceſſity for applying the nail of the thumb, and dividing this part of the cornea upon it: for if the knife is ſufficiently ſharp, no force is requiſite; and of conſequence the eye can ſuffer no motion from this ſtep of the operation,

and immoveable after the point of the knife is introduced into the cornea. This ſometimes happens, but it is not always the caſe. When it does, we may explain it, from the inciſion of the cornea throwing the muſcles into action, the office of which appears plain in each of them apart; ſince, being bent round the bulb of the eye as about a pulley, they muſt elevate, depreſs, or twiſt, the globe of the eye either towards the noſe or temples. Moreover, two of them acting together, may turn the eye in a diagonal betwixt the former directions, as upwards and outwards, upwards and inwards. When all theſe muſcles act together, the eye will be drawn towards their origin, and ſo be kept fixed and immoveable.

tion, which the application of the thumb was meant to prevent.

The incision of the cornea being compleated, the next ſtep of the operation is to diſengage the lens.

From preſſure imprudently applied, it is not uncommon to ſee the lens make its exit from the eye immediately upon the diviſion of the cornea; and this often happens without either any diſcharge of the vitreous humour or other accident.

But as this is a manner in which we would not wiſh to procure the iſſue of the lens, we ought to take every poſſible means to avoid it; and we ought therefore, before the ſpeculum is removed, to introduce cautiouſly the probe of De Winſel through the pupil, and gently ſcratch the capſule of the lens. After tearing this membrane, we muſt preſs the globe of the eye gently upwards, and by this means endeavour to diſcharge the cataract from the eye.

If the capſule is fairly divided, and the preſſure made with caution, there is little danger of any of the vitreous humour being diſcharged; but altho' a portion of it ſhould

come away, experience ſhews, that it, like the aqueous, is ſoon renewed.

De Winſel uſed to turn the patient's back to the light, after the diviſion of the cornea, to allow the pupil to dilate freely, and thereby promote the extraction of the lens: but I believe it would be much better to hang a curtain upon the window for this purpoſe. For, in the hands of common operators, this turning of the patient will be attended with great danger; particularly as it is yet improper to remove the ſpeculum; which if the ſurgeon does, he may depend upon it that its ſecond application, without the utmoſt care, will be productive of miſchief.

After the lens is extracted, we ought to examine carefully whether any portion of the iris has fallen between the lips of the wound in the cornea. If it has, we muſt immediately reduce it with the blunt end of a ſmall probe; for in a very ſhort time it will be ſo fixed in this place, as to render its reduction impoſſible, and in all probability the operation fruitleſs.

After the operation is performed, the eye-

lids

lids muſt be immediately ſhut; and a bit of linen rag, folded, and dipt in a ſolution of ſugar of lead in pure water, is to be applied over the eye; and the bandage, named *the* * *binoculus of Heiſter*, may be applied to ſupport this dreſſing.

If from the operation the eye is much inflamed, and the patient complains of great pain, a quantity of blood proportionate to the patient's age and habit ſhould be taken from the temporal artery †; or if the ſurgeon

* This bandage, by covering both eyes, will prevent the light from affecting the other eye, of which if it was in any degree ſenſible by its rolling might cauſe the eye that had undergone the operation perform the ſame motion.

† Surgeons are generally averſe to this operation, from a notion that the hæmorrhage is very difficult to ſtop. All that I can ſay upon this point is, that I have more than a dozen of times performed this operation upon the trunk of the artery where it lies upon the zeugomatic proceſs of the temporal bone, and have never found the hæmorrhage difficult to ſtop.

The idea that the ſides of the artery require to be preſſed together, is in many caſes erroneous and ill-

founded.

geon is timorous, cupping, or opening of the jugular vein, may be ſubſtituted: and this operation muſt be repeated occaſionally; and, if neceſſary, laxative medicines muſt be given at proper intervals. The patient ſhould be confined to a dark apartment, and follow an antiphlogiſtic regimen during the cure.

Anodynes, given at bed-time, may, in caſes of this kind, be of the greateſt ſervice, in procuring reſt, which is always of the greateſt conſequence to patients labouring under diſeaſes of the eyes.

In

founded. To prove this, I ſhall only mention one ſingle experiment that I have often made; *viz.* that, by laying the finger upon the orifice, we can ſtop the blooding, and at the ſame time perceive the pulſation in the branches beyond where the artery is opened: and I have always found, that the wound of the artery might be healed, without ſuch a degree of preſſure as to prevent this continued circulation, which muſt always happen when the ſides of the artery are preſſed together; of which we may be convinced, by preſſing the temporal artery of one's own head againſt the zeugomatic proceſs; in that caſe, the pulſation of its branches is altogether ſtopt.

In about the ſpace of ten days, the wound of the cornea is almoſt united; but a conſiderable opacity, which ſometimes extends a conſiderable way, often remains for many weeks. The duration of the inflammation varies in different patients. While it remains, the patient ought to be kept in a dark apartment, into which the light may afterwards be admitted by degrees as the eye ſhall be found able to bear it.

When the patient goes abroad, he ought, until the eye becomes ſtrong, to wear what are called *gogles:* only with this difference, that they are to be made, on the fore-part, of gauze, inſtead of glaſs; by which means, the light will be prevented from hurting the eye.

I have hitherto deſcribed the operation as being performed upon the left eye: but if the right eye is to be operated upon, the ſurgeon muſt either uſe his left hand, or have recourſe to the knife invented by Mr Miller, which is made upon the ſame principles as that uſed for the left eye; only with this difference, that its blade is ſhorter, and fixed to the handle (which is made of copper)

copper) at a right angle. With this knife the ſurgeon begins the inciſion at the inner ſide of the cornea, and brings out its point at the oppoſite ſide next the temples. It was in this manner that I performed the operation upon the patient's right eye, whoſe caſe is related in the Medical Commentaries.

FINIS.